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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,631	12/13/2001	Brian Fahs	10019977-1	9217

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EXAMINER
RAMPURIA, SATISH

ART UNIT	PAPER NUMBER
2191	

DATE MAILED: 06/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/020,631	FAHS ET AL.
	Examiner	Art Unit	
	Satish S. Rampuria	2191	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>10 January 2005</u>.

2a)☒ This action is **FINAL**.　　2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
　　closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-24</u> is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-24</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☐ All　b)☐ Some * c)☐ None of:

　　　1.☐ Certified copies of the priority documents have been received.

　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
　　　　　application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
　　Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
　　Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

Response to Amendment

1.   This action is in response to the amendment received on 01/10/2005.

2.   Claims amended by the applicant: 1, 2, 4-6, 8-10, 12-17, 20-22 and 24.

3.   Claims pending in the application: 1-24.

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –
(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign
country, before the invention thereof by the applicant for a patent.
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this
country, more than one year prior to the date of application for patent in the United States.
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United
States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the
United States before the invention by the applicant for patent, except that an international application filed under the treaty
defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if
the international application designated the United States and was published under Article 21(2) of such treaty in the English
language.

2.   Claims 1, 3, 4, 7, 8, 9, 11,15, 17, 19, and 23 rejected under 35 U.S.C. 102(e) as being

anticipated by US Patent No. 6,182,282 to Stoodley et al. (hereinafter called Stoodley).

Per claim 1:

Stoodley disclose:

- A computer-implemented method for analyzing a virtual function (col. 4, lines 28-30

"computer implemented method of compiling… a computer program for calling at least

one… virtual function"), said method comprising:

- locating ~~determining whether~~ a virtual table ~~exists~~ for a virtual function(col. 4, lines 32-

35 "determining… virtual functions… in a virtual function table"), <u>said virtual table</u>

comprising a start address for said virtual function (col. 4, lines 35-45 "constructing said virtual function table... for any new virtual function introduced... virtual function includes an address adjustment value... each new virtual function comprises an address pointer representing one of the location of an address..."); and

- determining a call type for said a virtual function (col. 4, lines 29-30 "a computer program for calling... virtual function");

- creating an instruction for said virtual function (col. 4, lines 48-49 "compiling a call to a virtual function"), said instruction comprising a control transfer function that directs execution to instrumentation code (col. 5, lines 21-22 "transferring execution of the program to the address indicated by the address pointer" and col. 4, lines 54-55 "determining a location of an entry for said virtual function in a virtual function table"); and

- rewriting said virtual table with a modified virtual table comprising an address for said instruction instead of said start address (col. 4, lines 40-46 "each entry for each remaining inherited virtual function and for each new virtual function comprises an address pointer representing one of the location of an address adjustment program and an address of said function"), wherein upon a call to said virtual function, said address for said instruction is loaded (col. 4, lines 48-55 "compiling a call to a virtual function... an address adjustment value would be stored in a virtual function table...").

Per claim 3:

The rejection of claim 1 is incorporated, and further, Stoodley disclose:

- wherein said call type is selected from the group comprising direct, indirect, and virtual substantially as claimed (col. 4, lines 66-67 "employing said entry to operably construct a call to said virtual function").

Per claim 7:

The rejection of claim 1 is incorporated, and further, Stoodley disclose:

- determining from which location said virtual function has been called (col. 4, lines 54-55 "determining a location of an entry for said virtual function in a virtual function table").

Claims 9, 11, and 15 are the computer program product claim corresponding to method claims 1, 3, and 7 respectively, and rejected under the same rational set forth in connection with the rejection of claims 1, 3, and 7 respectively, above.

Claims 17, 19, and 23 are the apparatus claim corresponding to method claims 1, 3, and 7 respectively, and rejected under the same rational set forth in connection with the rejection of claims 1, 3, and 7 respectively, above.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a

whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 2, 4, 5, 6, 10, 12, 13, 14, 16, 18, 20, 21, 22 and 24 rejected under 35

        U.S.C. 103(a) as being unpatentable over Stoodley in view of US Patent No. 6,263,491 to

        Hunt (hereinafter called Hunt).

Per claim 2:

The rejection of claim 1 is incorporated, and further, Stoodley does not explicitly disclose

performing instrumentation on said virtual function based upon said call type.

        However, Hunt discloses in an analogous computer system performing instrumentation

(col. 3, lines 50 "instrumentation packages for performing operations on the applications") on

said virtual function based upon said call type (col. 11, lines 1-2 "calling indirectly through an

interface's virtual function table").

        Therefore, it would have been obvious to a person of ordinary skill in the art at the time

the invention was made to incorporate the method of performing instrumentation on said virtual

function based upon said call type as taught by Hunt into the method of analyzing and

determining if the virtual function table exist as taught by Stoodley. The modification would be

obvious because of one of ordinary skill in the art would be motivated to perform instrumenting

on virtual functions to reduce the overhead for particular operation as suggested by Hunt (col. 3,

lines 18-37).

Per claim 4:

The rejection of claim 2 is incorporated, and further, Stoodley disclose:

- executing said instrumentation code such that control is delivered to said instrumentor (col. 9, lines 49-51 "The hybrid VFT implementation allows classes compiled by an old compiler to be integrated with newly compiled classes without recompilation of the old classes").

Per claim 5:

The rejection of claim 4 is incorporated, and further, Stoodley does not explicitly disclose performing a desired instrumentation task by said instrumentor; and ~~resume~~ resuming execution by said instrumentor at said start ~~existing~~ address previously contained in said virtual table.

However, Hunt discloses in an analogous computer system performing a desired instrumentation task by said instrumentor (col. 3, lines 49-51 "Different versions... are packaged in different instrumentation packages for performing operations on the application"); and ~~resume~~ resuming execution by said instrumentor (col. 44, line 3 "resumes application execution") at said start ~~existing~~ address previously contained in said virtual table (col. 44, lines 6-8 "leaving the instrumentation runtime firmly embedded in the application's address space").

The feature of instrumenting and resume execution at an address would be obvious for the reasons set forth in the rejection of claim 2.

Per claim 6:

The rejection of claim 4 is incorporated, and further, Stoodley does not explicitly disclose overwriting said instrumentation code with instrumentation code which performs a desired instrumentation task; and providing ~~provide~~ an instruction at the end of said instrumentation

code wherein said instruction points back to said start ~~existing~~ address previously contained in said virtual table.

However, Hunt discloses in an analogous computer system overwriting said instrumentation code with instrumentation code which performs a desired instrumentation task (col. 45, lines 3-5 "the new imports section 670 can be overwritten with a binary rewriter to include the second library instead of the first, and the application re-binded"); and providing ~~provide~~ an instruction at the end of said instrumentation code wherein said instruction points back to said start ~~existing~~ address previously contained in said virtual table (col. 45, lines 22-25 "an interface is a pointer to a virtual function table (VTBL, pronounced "V-Table"). A component client always accesses an interface through an interface pointer (a pointer to the pointer to a virtual function table)").

The feature of overwriting instrumenting code and provide an instruction at an address would be obvious for the reasons set forth in the rejection of claim 2.

Per claim 8:

The rejection of claim 4 is incorporated, and further, Stoodley disclose:

- maintaining a mapping between said start ~~existing~~ address for said virtual function and said new address for said virtual function (col. 4, lines 61-65 "each entry for each remaining inherited virtual function and for each new function comprises an address pointer representing one of the location of an address adjustment program and an address of said function").

Claims 10, 12, 13, 14 and 16 are the computer program product claim corresponding to method

claims 2, 4, 5, 6, and 8 respectively, and rejected under the same rational set forth in connection

with the rejection of claims 2, 4, 5, 6, and 8 respectively, above.

Claims 18, 20, 21, 22 and 24 are the apparatus claim corresponding to method claims 2, 4, 5, 6,

and 8 respectively, and rejected under the same rational set forth in connection with the rejection

of claims 2, 4, 5, 6, and 8 respectively, above.

Response to Arguments

4.   Applicant's arguments with respect to claims have been considered but they are not

persuasive.

In the remarks, the applicant has argued that:

(i)   Stoodley and/or in combination with Hunt, does not teach or suggest rewriting a

virtual function table with a modified table that includes an address for an instruction

that directs execution to instrumentation code, as recited in independent claims 1, 9

and 17.

Examiner's response:

(i)   Regarding the limitation "rewriting a virtual function table with a modified table that

includes an address for an instruction that directs execution to instrumentation code",

Stoodley system does provide virtual function table from class compiled with

compilers using different (modified) virtual function table layouts where each entry

of each virtual function and for each new virtual function comprises and address

pointer representing one of the location of an address adjustment program and address

of that function (see col. 4, lines 21-67). Applicant only makes general allegations

and does not point out any errors in the rejection Therefore, the rejection is proper

and maintained herein.

Conclusion

5.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing

date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to **Satish S. Rampuria** whose telephone number is **(571) 272-3732**.

The examiner can normally be reached on **8:30 am to 5:00 pm** Monday to Friday except every

other Friday and federal holidays. Any inquiry of a general nature or relating to the status of this

application should be directed to the **TC 2100 Group receptionist: 571-272-2100**

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, **Tuan Q. Dam** can be reached on **(571) 272-3695**. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Satish S. Rampuria
Patent Examiner
Art Unit 2191
06/13/2005

WEI Y. ZHEN
PRIMARY EXAMINER